CLAIMS

WE CLAIM:

1. An improved process for making a T-20 or a T-1249 composition, or a fragment of a T-20 or a T-1249 composition, optionally using chlorotrityl chloride linkers covalently bound to resin beads, in which said improvement comprises:

using a plurality of low void space resin beads, optionally loaded with an amino acid or amino acid derivative, to create one or more T-20 or T-1249 fragments, said low void space resin beads having no void spaces greater than 5 μm, and said low void space resin beads comprising at least fifty percent by count of all resin beads used to make said T-20 or said T-1249 composition.

2. The process of claim 2 in which said plurality of low void space resin beads comprise a plurality of beads having no void spaces greater than 3 μm.

3. The process of claim 3 in which said plurality of low void space resin beads comprise a plurality of beads having no void spaces greater than 2 μm.

4. The process of claim 4 in which said plurality of low void space resin beads comprise a plurality of beads having no void spaces greater than 1 μm.

5. The process of claim 1 in which said low void space resin beads comprise chlorotrityl chloride linkers covalently bound thereto, and in

which said low void space resin beads are loaded with one or more amino acids or amino acid derivatives.

6. The process of claim 1 in which said plurality of resin beads comprise 0.5 to 1.5 mole percent divinylbenzene.

7. The process of claim 1 in which said beads comprise one or more amino acids covalently linked thereto, the process further comprising adding to said T-20 or T-1249 fragments less than or equal to 1.5 equivalents of a subsequent amino acid to grow said T-20 or T-1249 fragments.

8. The process of claim 1 in which said T-20 or T-1249 fragment comprises a terminal amino acid or terminal amino acid derivative, the process further comprising coupling to said terminal amino acid or said terminal amino acid derivative a subsequent amino acid.

9. The process of claim 1 in which said plurality of resin beads having said T-20 or T-1249 fragments thereon are capable of being coupled to a subsequent amino acid or amino acid derivative such that within less than 2 hours a negative Kaiser test is observed.

10. The process of claim 1 further comprising recycling said plurality of low void space resin beads.

11. The process of claim 1 further comprising preparing a T-20 or T-1249 fragment having greater than about 10 amino acids, said process being free of recouples.

12. The process of claim 1 further comprising preparing a T-20 or T-1249 fragment having greater than about 15 amino acids, said process being free of recouples.

13. The process of claim 1 further comprising assembling one or more of said T-20 or T-1249 fragments.

14. A T-20 or T-1249 composition, in which one or more fragments of T-20 or T-1249, are made by the process of claim 1.

15. An improved process for making a polypeptide composition, or a fragment of a polypeptide composition, optionally using chlorotrityl chloride linkers covalently bound to resin beads, in which said improvement comprises:

using a plurality of resin beads having no void spaces greater than 5 μm, said resin beads being optionally loaded with an amino acid or amino acid derivative, to create one or more polypeptide fragments, said resin beads comprising at least sixty percent by count of all beads used in a vessel that is used to make said polypeptide composition.

16. The process of claim 15 in which said resin beads comprise at least seventy percent by count of all beads.

17. The process of claim 16 in which said resin beads comprise at least eighty percent of beads by count of all beads.

18. The process of claim 17 in which said resin beads comprise at least ninety percent of beads by count of all beads.

19. The process of claim 18 in which said resin beads comprise at least ninety five percent of beads by count used to make said polypeptide material.

20. The process of claim 18 in which each of said resin beads comprise 0.5 to 1.5 percent divinylbenzene.

21. The process of claim 20 in which said resin beads are made with divinylbenzene having a purity from 55% to 82%.

22. The process of claim 15 in which said resin beads are produced by jetting or seed expansion.

23. An improved process for making a polypeptide composition, or a fragment of a polypeptide composition, optionally using chlorotrityl chloride linkers covalently bound to resin beads, in which said improvement comprises:

using a plurality of resin beads having no void spaces greater than 5 μm, said resin beads being optionally loaded with an amino acid or amino acid derivative, to create one or more polypeptide fragments, said resin beads comprising at least sixty percent by count of all beads used to make said polypeptide composition, all said resin beads comprising spherical copolymer beads having a particle diameter in the range of 75 to 200 microns, and said resin beads being produced by suspension polymerization.

24. The process of claim 23 in which said resin beads are made using one or more monomers, and made in an aqueous phase of a suspension polymerization mixture which is maintained at a pH from 9 to 11.5.

25. The process of claim 24 in which said resin beads are made using a polymerization initiator selected from the group consisting a peroxide, a hydroperoxide, a peroxyester, a benzoyl peroxide, a tert-butyl hydroperoxide, a cumene peroxide, a tetralin peroxide, an acetyl peroxide, a caproyl peroxide, a tert-butyl peroctoate, a tert-butyl perbenzoate, a tert-butyl diperphthalate, a dicyclohexyl peroxydicarbonate, a di(4-tert-butylcyclohexyl)peroxydicarbonate, a methyl ethyl ketone peroxide, an azo initiator, an azodiisobutyronitrile, an azodiisobutyramide, a 2,2'?azo-bis(2,4-dimethylvaleronitrile), a azo-bis(a-methyl-butyronitrile), a dimethyl-azo-bis(methylvalerate), a diethyl-azo-bis(methylvalerate), and a dibutyl azo-bis(methylvalerate).

26. The process of claim 23 in which said resin beads are prepared using an enzyme treatment to cleanse a surface of said resin beads.

27. The process of claim 26 in which said enzyme treatment comprises contacting a polymeric phase with enzymatic material during polymerization, following polymerization, or after isolation of a polymer.

28. The process of claim 27 in which said enzymatic material is selected from the group consisting of a cellulose-decomposing enzyme, a proteolytic enzyme, a urokinase, an elastase and an enterokinase.

29. The process of claim 23 in which said resin beads are produced by a method comprising: (a) preparing a suspension polymerization mixture in

a vessel; said mixture comprising: (i) a monomer mixture comprising at least one vinyl monomer and at least one crosslinker; and (ii) from 0.25 mole percent to 1.5 mole percent of at least one free radical initiator; (b) removing oxygen from the suspension polymerization mixture and the vessel by introducing an inert gas for a time sufficient to produce an atmosphere in the vessel containing no more than 5 percent oxygen; (c) allowing the monomer mixture to polymerize; and (d) optionally washing the beads with a swelling solvent.

30. The process of claim 23 in which said resin beads are made from copolymer comprising less than 5% of organic extractables.

31. The process of claim 30 in which said resin beads are made from copolymer comprising less than 3% of organic extractables.

32. The process of claim 31 in which said resin beads are made from copolymer comprising less than 2% organic extractables.

33. The process of claim 32 in which said resin beads are made from copolymer comprising comprise less than 1% organic extractables.

34. The process of claim 23 in which said resin beads are prepared using a process that leaves an amount of organic extractable material present in said resin beads after manufacture thereof to reduce the formation of void spaces in the resin beads after washing with a solvent such that 50% or more of said resin beads by count comprise void spaces no greater than 5 microns.

35. An improved process for making a T-20 or T-1249 polypeptide composition, optionally using linkers covalently bound to resin beads, in which said improvement comprises:

using a plurality of resin beads functionalized using a nitro-containing compound to make one or more fragments of said polypeptide composition, said resin beads being optionally loaded with an amino acid or amino acid derivative; assembling said one or more fragments to make said polypeptide composition; and optionally recycling said plurality of resin beads.

36. The process of claim 35 in which nitro-containing compound is a C1-C6 nitroalkane or a nitro-aryl.

37. The process of claim 36 in which said nitro-containing compound is selected from the group consisting of nitro-benzene or nitro-toluene.

38. A T-20 or T-1249 composition, in which one or more fragments of T-20 or T-1249, are made by the process of claim 35.

39. An improved process for making a polypeptide composition, or a fragment of a polypeptide composition, optionally using linkers covalently bound to resin beads, in which said improvement comprises:

using a plurality of functionalized resin beads prepared using a chloride corrosion resistant filter, said resin beads being optionally loaded with an amino acid or amino acid derivative, to create one or more polypeptide fragments; and, optionally recycling said resin beads.

40. The process of claim 39 in which said chloride corrosion resistant filter comprises a nickel alloy filter.

41. The process of claim 40 in which said nickel alloy filter is a Hastalloy™ filter.

42. The process of claim 41 in which said chloride corrosion resistant filter is selected from the group consisting of a glass lined filter or a Teflon™ lined filter.

43. The process of claim 39 in which said resin beads comprise 0.5% to 1.5% DVB.

44. The process of claim 40 in which said resin beads have CTC linkers thereon.

45. The process of claim 41 in which one gram of said resin beads will swell to between four to seven cubic centimeters.

46. A T-20 or T-1249 composition, in which one or more fragments of T-20 or T-1249, are made by the process of claim 39.

47. An improved process for making a polypeptide composition, or a fragment of a polypeptide composition, optionally using linkers covalently bound to resin beads, in which said improvement comprises:

using a plurality of functionalized resin beads made from copolymer comprising less than 5% organic extractables, said resin beads being optionally loaded with an amino acid or amino acid derivative, to create one or more polypeptide fragments; and, optionally recycling said resin beads.

48. The process of claim 47 in which said resin beads are made from copolymer comprising less than 3% of organic extractables.

49. The process of claim 48 in which said resin beads are made from copolymer comprising less than 2% organic extractables.

50. The process of claim 49 in which said resin beads are made from copolymer comprising comprise less than 1% organic extractables.

51. The process of claim 1 in which said using is performed in an industrially sized vessel, said industrially sized vessel optionally having a capacity of at least 50 liters.

52. The process of claim 43 in which said using is performed in an industrially sized vessel, said industrially sized vessel having a filtering surface of at least one half square meter.

53. An improved process for making a polypeptide composition, or a fragment of a polypeptide composition, optionally using linkers covalently bound to resin beads, in which said improvement comprises:

using a plurality of free flowing resin beads to create one or more polypeptide fragments, said free flowing resin beads being prepared under agitation with a non-swelling solvent after washing thereof and before drying thereof.

54. An improved process for making a T-20 or T-1249 composition, or a fragment thereof, in which said improvement comprises:

using functionalized resin beads having a homogeneous density to create one or more polypeptide fragments.

55. The process of claim 54 in which greater than 50 percent of total beads within a batch of functionalized resin beads have a homogeneous density.